

Application No. 10/047,545
Amendment dated October 4, 2007
Reply to Office Action of April 4, 2007

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-153. (cancelled)

154. (previously presented) An interbody spinal fusion implant for insertion within an implantation space formed across the height of a disc space between adjacent vertebral bodies of a human spine, said implant comprising:

a body having a leading end for insertion first into the disc space, a trailing end opposite said leading end, a central longitudinal axis therebetween, and a length along the central longitudinal axis, said body having opposed arcuate portions between said leading and trailing ends adapted to be placed within the implantation space oriented toward the adjacent vertebral bodies, respectively, said opposed arcuate portions having at least one opening therethrough, said openings being in communication with one another to permit for the growth of bone from adjacent vertebral body to adjacent vertebral body through said implant, said body having at least one truncated side along at least a portion of the central longitudinal axis between said opposed arcuate portions and between said leading and trailing ends; and

a thread along at least a portion of the length of said body adapted to engage said implant to the adjacent vertebral bodies, said thread having a thread height measured from said body which is greatest at said at least one truncated side, said at least one truncated side having a truncated portion between said thread and said leading end.

155. (previously presented) The spinal fusion implant of claim 154, wherein said opposed arcuate portions are in an angular relationship to each other along at least a portion of the length of said implant sufficient to maintain the adjacent vertebral bodies in an angular relationship to each other.

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156. (previously presented) The spinal fusion implant of claim 155, wherein said implant is configured to be inserted from a posterior approach to the vertebral bodies.
 157. (previously presented) The spinal fusion implant of claim 155, wherein said implant is configured to be inserted from an anterior approach to the vertebral bodies.
 158. (previously presented) The spinal fusion implant of claim 154, wherein each of said opposed portions comprises an interior surface, said interior surfaces being spaced apart to define a hollow interior in communication with said openings.
 159. (previously presented) The spinal fusion implant of claim 158, wherein said implant includes an access opening for accessing said hollow interior.
 160. (previously presented) The spinal fusion implant of claim 159, wherein said access opening is configured to permit introduction of a fusion promoting substance into said hollow interior.
 161. (previously presented) The spinal fusion implant of claim 159, further comprising a cap for closing said access opening.
 162. (previously presented) The spinal fusion implant of claim 154, wherein said body has a second truncated side along the central longitudinal axis and opposite to said one truncated side.
 163. (previously presented) The spinal fusion implant of claim 154, further in combination with a fusion promoting substance.
 164. (previously presented) The spinal fusion implant of claim 163, wherein said fusion promoting substance is bone morphogenetic protein.
 165. (previously presented) The spinal fusion implant of claim 163, wherein said fusion promoting substance includes hydroxyapatite.
 166. (previously presented) The spinal fusion implant of claim 163, wherein said fusion promoting substance includes hydroxyapatite tricalcium phosphate.
- Claim 167. (cancelled)

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168. (previously presented) The spinal fusion implant of claim 163, wherein said fusion promoting substance is bone.
169. (previously presented) An interbody spinal fusion implant for insertion across a disc space between adjacent vertebral bodies of a human spine, said implant comprising a body having a substantially cylindrical configuration, a longitudinal central axis and at least one truncated side forming a planar surface parallel to said central axis, said body having an insertion end, a trailing end, and an outer surface including a thread for engaging said implant to the adjacent vertebral bodies of the spine, the locus of said thread forming a substantially cylindrical configuration.
170. (previously presented) The spinal fusion implant of claim 169, wherein said implant comprises a bone ingrowth material.
171. (previously presented) The spinal fusion implant of claim 169, wherein said implant comprises a fusion promoting material.
172. (previously presented) The spinal fusion implant of claim 169, wherein said implant is at least in part bioabsorbable.
173. (previously presented) The spinal fusion implant of claim 169, having a plurality of openings capable retaining fusion promoting material.
174. (previously presented) The spinal fusion implant of claim 169, wherein said thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being substantially uniform for at least a portion of said implant.
175. (previously presented) The spinal fusion implant of claim 169, wherein said thread has a thread radius measured from the longitudinal central axis of said implant, said thread radius being variable along at least a portion of said implant.
176. (previously presented) The spinal fusion implant of claim 169, wherein said thread has a thread height measured from said body which is variable along at least a portion of said implant.

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177. (previously presented) The spinal fusion Implant of claim 169, wherein said thread has a thread height measured from said body which is substantially constant along the length of said Implant.
178. (previously presented) The spinal fusion implant of claim 169 body comprises a porous material.
179. (previously presented) The spinal fusion Implant of claim 169, wherein said body has an internal chamber and means for accessing said internal chamber.
180. (previously presented) The spinal fusion Implant of claim 179, wherein said internal chamber is capable of containing fusion promoting material.
181. (previously presented) The spinal fusion implant of claim 179, wherein said internal chamber includes a wall surrounding said internal chamber.
182. (previously presented) The spinal fusion implant of claim 181, wherein said wall has a plurality of openings passing therethrough in communication with said internal chamber.
183. (previously presented) The spinal fusion Implant of claim 179, wherein said implant has means for closing said accessing means.
184. (previously presented) The spinal fusion implant of claim 169, wherein one of said ends includes an engagement means for engaging instrumentation for the insertion of said implant.
185. (previously presented) The spinal fusion implant of claim 169, wherein at least a portion of said outer surface comprises wells having at least partial walls.
186. (previously presented) The spinal fusion implant of claim 169, wherein said Implant is configured to be placed in close proximity in a side by side alignment to a second spinal fusion implant, said first and second implants when placed together having a combined overall width that is less than the sum of the individual maximum diameters of each of said first and second implants.
187. (previously presented) The spinal fusion implant of claim 169, wherein said body has a second truncated side forming a planar surface parallel to said central axis and opposite to said one truncated side.

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188. (previously presented) The spinal fusion implant of claim 187, wherein said thread has a thread height measured from said body which is greatest at at least one of said truncated sides.
189. (previously presented) The spinal fusion implant of claim 169, wherein said thread has a thread height measured from said body which is greatest at said truncated side.
190. (previously presented) The spinal fusion implant of claim 169, wherein said implant has an upper and lower portion for engaging the bone of the adjacent vertebral bodies, said upper and lower portions comprising a plurality of macroscopic openings.
191. (previously presented) The spinal fusion implant of claim 169, wherein said body has a plurality of openings passing therethrough so as to allow bone to grow from adjacent vertebral body to adjacent vertebral body and through said implant.
192. (previously presented) The spinal fusion implant of claim 169, wherein said implant is made of a material that is stronger than bone.
193. (previously presented) The spinal fusion implant of claim 169, in combination with a fusion promoting substance.
194. (previously presented) The spinal fusion implant of claim 193, wherein said fusion promoting substance includes at least one of bone, bone morphogenetic protein, hydroxyapatite, and hydroxyapatite tricalcium phosphate.
195. (previously presented) An interbody spinal fusion implant for insertion within an implantation space formed across the height of a disc space between adjacent vertebral bodies of a human spine, said implant comprising:
 - a body having a leading end for insertion first into the disc space, a trailing end opposite said leading end, a mid-longitudinal axis through said leading and trailing ends, and opposed arcuate portions between said leading and trailing ends adapted to be placed within the implantation space oriented toward the adjacent vertebral bodies, respectively, said opposed arcuate portions having at

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least one opening therethrough, said openings being in communication with one another to permit for the growth of bone from adjacent vertebral body to adjacent vertebral body through said implant; and

a thread adapted to engage said implant to the adjacent vertebral bodies, said thread having a thread height measured from said body, said thread height being variable along more than one turn of said thread about the mid-longitudinal axis of said body.

196. (previously presented) The spinal fusion implant of claim 195, wherein said implant is at least in part bioabsorbable
197. (previously presented) The spinal fusion implant of claim 195, wherein each of said arcuate portions include a plurality of openings therein.
198. (previously presented) The spinal fusion implant of claim 195, wherein said body has an internal chamber and means for accessing said internal chamber.
199. (previously presented) The spinal fusion implant of claim 198, wherein said internal chamber is capable of containing fusion promoting material.
200. (previously presented) The spinal fusion implant of claim 198, wherein internal chamber said includes a wall surrounding said internal chamber.
201. (previously presented) The spinal fusion implant of claim 200, wherein said wall has a plurality of openings passing therethrough in communication with said internal chamber.
202. (previously presented) The spinal fusion implant of claim 198, wherein said implant has means for closing said accessing means.
203. (previously presented) The spinal fusion implant of claim 195, wherein one of said ends is configured to engage instrumentation for the insertion of said implant.
204. (previously presented) The spinal fusion implant of claim 195, wherein said implant is configured to be placed in close proximity in a side by side alignment to a second spinal fusion implant, said first and second implants when placed together having a combined overall width that is less than the sum of the

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individual maximum diameters of each of said first and second implants.

205. (previously presented) The spinal fusion Implant of claim 195, wherein said body has a first truncated side forming a planar surface parallel to the mid-longitudinal axis
206. (previously presented) The spinal fusion implant of claim 205, wherein said body has a second truncated side forming a planar surface parallel to the mid-longitudinal axis and opposite to said first truncated side.
207. (previously presented) The spinal fusion implant of claim 206, wherein said thread has a thread height measured from said body which is greatest at at least one of said truncated sides.
208. (previously presented) The spinal fusion implant of claim 205, wherein said thread has a thread height measured from said body which is greatest at said first truncated side.
209. (previously presented) The spinal fusion Implant of claim 195, wherein said Implant is made of a material that is stronger than bone.
210. (previously presented) The spinal fusion implant of claim 195, in combination with a fusion promoting substance.
211. (previously presented) The spinal fusion Implant of claim 210, wherein said fusion promoting substance includes at least one of bone, bone morphogenetic protein, hydroxyapatite, and hydroxyapatite tricalcium phosphate.
212. (previously presented) The spinal fusion implant of claim 195, wherein said thread has a variable height along each turn of said thread about the mid-longitudinal axis of said body.
213. (previously presented) The spinal fusion implant of claim 195, wherein said thread is uninterrupted.
214. (previously presented) The spinal fusion Implant of claim 195, wherein an outer locus of said thread has a substantially cylindrical configuration.
215. (previously presented) The spinal fusion implant of claim 195, wherein said body has a substantially cylindrical configuration.

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216. (previously presented) The spinal fusion Implant of claim 195, wherein said thread has a pitch, further comprising a second thread around the mid-longitudinal axis of said body, said second thread having a pitch that is different than the pitch of said thread.
217. (previously presented) The spinal fusion implant of claim 216, wherein said second thread is adapted to engage an associated thread of an implant cap.
218. (previously presented) The spinal fusion Implant of claim 216, wherein said second thread is adapted to engage an associated thread of an implant inserter tool.
219. (previously presented) A fusion device for facilitating arthrodesis in the disc space between adjacent vertebrae, comprising:
an elongated body having a length and an outer surface extending along said length, said outer surface including a pair of oppositely disposed arcuate portions and a pair of substantially flat portions extending between said pair of arcuate portions, said pair of arcuate portions defining external threads extending substantially entirely along said length of said body, said pair of substantially flat portions extending along a substantial portion of said length of said body, said pair of substantially flat portions terminating adjacent a first end of said elongated body, said external threads defining at least one circumferentially continuous thread extending along a majority of the length of said elongated body.
220. (previously presented) A fusion device for facilitating arthrodesis in the disc space between adjacent vertebrae, comprising:
an elongated body having a length and an outer surface extending along said length, said outer surface including a pair of oppositely disposed arcuate portions and a pair of substantially flat portions extending between said pair of arcuate portions, said pair of arcuate portions defining an external thread extending substantially entirely along said length of said body, said pair of substantially flat portions extending along a substantial portion of said length of

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said body, said substantially flat portions being interrupted by said thread, said elongated body defining a hollow interior, said pair of arcuate portions each defining at least one opening extending therethrough in communication with said hollow interior.

221. (new) A fusion device for facilitating arthrodesis in the disc space between adjacent vertebrae, comprising:

an elongated body having a length and an outer surface extending along said length, said outer surface including a pair of oppositely disposed arcuate portions and at least one substantially flat portion extending between said pair of arcuate portions, said pair of arcuate portions defining external threads extending substantially entirely along said length of said body, said at least one substantially flat portion extending along a substantial portion of said length of said body, said at least one substantially flat portion terminating adjacent a first end of said elongated body, said external threads defining at least one circumferentially continuous thread extending along a majority of the length of said elongated body.